

**Environmental Health Report
No. xxxxx
World Trade Center Support Health
Assessment Survey**

DRAFT

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ACRONYM LIST

ACSOPS	Assistant Chief of Staff for Operations
AFEB	Armed Forces Epidemiology Board
AFMOA	Air Force Medical Operations Agency
AGR	Active Guard and Reserve
AHC	Army Health Clinic
AMC	Army Medical Center
AMEDD	Army Medical Department
AMSA	Army Medical Surveillance Activity
COE	U. S. Army Corps of Engineers
DCSIM	Deputy Chief of Staff for Information Management
DEDS	Directorate of Epidemiology and Disease Surveillance
DHPW	Directorate of Health Promotion and Wellness
DOD	Department of Defense
DOIM	Department of Information Management
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, Fourth Revision
HA	Health Affairs
HCP	Health Care Provider
IM	Information Management
IMD	Information Management Division
IPR	In Process Review
IRB	Institutional Review Board
MHS	Military Health System
MTF	Military Treatment Facility
NARMC	North Atlantic Regional Medical Command
NIOSH	National Institute for Occupational Safety and Health
NJARNG	New Jersey Army National Guard
NYARNG	New York Army National Guard
OPLAN	Operational Plan
OTSG	Office of the Surgeon General, U.S. Army
PAO	Public Affairs Office
PHQ	Public Health Questionnaire
PM	Preventive Medicine
POI	Program of Instruction
PPDHA	Pentagon Post Disaster Health Assessment
PRIME-MD	Primary Care Evaluation for Mental Disorders
PTMS	Plans, Training, Mobilization & Security
PTSD	Post Traumatic Stress Disorder
TSG	The Surgeon General
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USACOE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USUHS	Uniformed Services University of Health Sciences

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VOC's	Volatile Organic Hydrocarbons
WRAIR	Walter Reed Army Institute of Research
WRAMC	Walter Reed Army Medical Center
WTCSHA	World Trade Center Support Health Assessment

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EXECUTIVE SUMMARY ENVIRONMENTAL PROGRAM REPORT NO. XXX

1. The World Trade Center Support Health Assessment (WTCSHA) survey was initiated as an outreach program for all Department of the Army personnel (military and civilian), who supported the rescue and relief efforts at the World Trade Center sites. It was intended to document injuries, illnesses, and exposures sustained by these personnel, and to provide them the opportunity to have their concerns addressed in the aftermath of the events of 11 September 2001.

2. The U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) initially began supporting efforts at the World Trade Center site within the first 24 hours, making recommendations for the use of personal protective equipment, specifically recommendations on the use of respiratory protection. The USACHPPM developed a questionnaire for those employees who were at the Pentagon at the time of 9-11 attack as part of Operation Noble Eagle, this was done to assess the medical needs of this group, and to determine what structural factors influenced the injury patterns. It was decided to offer a similar questionnaire to those Army personnel who had supported the WTC efforts.

3. The methodology utilized to develop and deploy the Pentagon Post Disaster Health Assessment survey involved a multidisciplinary approach extending over several directorates within the USACHPPM and a partnership with WRAIR. The WTCSHA was based on the previous PPDHA effort and a survey developed by the Army Corps of Engineers for their WTC workers. The WTCSHA was distributed using both the local Occupational Health clinics where available and by direct mailings where no local clinic was available.

4. Survey Development

a. The WTCSHA was based on the previous PPDHA and a survey developed for the Army Corps of Engineers for their workers that had supported the WTC effort. The PPDHA survey had been developed by USACHPPM using concepts from the previous survey instruments utilized in the Oklahoma City Bombing, Khobar Tower bombings, and input from multiple civilian and military disciplines. (See Population Health Outcomes Report No. 13-HG-7685-02, Pentagon Post Disaster Health Assessment Survey.)

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b. The Public Health surveys and interventions such as the WTCSHA and the PPDHA are not considered research by the CDC, National Institute for Occupational Safety and Health and DoD, therefore while an institutional review board was consulted, approval was not required.

5. Survey Deployment

a. The voluntary survey was available as a paper questionnaire only and was initially distributed through the Occupational Health Clinics at those posts that had sent several employees. For those personnel who had come singly from multiple locations or those soldiers who had been deployed in support of the war in Afghanistan, the questionnaire was mailed directly to them.

b. The New York Army National Guard has elected to use a survey developed by their Public Health Department. A summary of that data is not yet available.

c. The New Jersey Army National Guard sent 125 questionnaires directly to their soldiers with the questionnaires sent back to the NJARNG. A total of 94 questionnaires were returned and forwarded to the USACHPPM. This represents the single largest source of questionnaire responses.

6. Survey Results

a. A total of 116 Active Army personnel (military and civilian) were requested to complete the survey. Of these 68 returned a completed survey (57%). Additionally the NJARNG had 125 questionnaires sent out with 94 (75%) returned. These were forwarded to USACHPPM in September 2002. This results in an overall response rate of 67%.

The NY ARNG had approximately 5000 involved in the rescue and recovery efforts. Of these 196 were Active Guard and Reserve (AGR) and 278 were Military Technicians who served in the vicinity of WTC 11 Sept 01 - 23 Dec 01. These personnel were included in the New York Department of Health evaluation process but the information is not available and is not included in this report.

b. A total of 40 respondents requested to be contacted in regards to their exposures. Of this total, the NJ ARNG had 34 requests to be contacted (36% of NJARNG responders, 17% overall).

c. Of the 162 respondents, 88 (55%) participated in the rescue and recovery efforts with 54 (33%) participating at Ground Zero. A total of 51 (31%) worked within the exclusion zone, 39 (24%) worked at Ground Zero, but outside the

exclusion zone and 96 (59%) worked at the Fresh Kills Landfill. (Note, some reported as working at more than one location.)

d. Among respondents 78 (56%) reported no problems in the 12 months prior to 9/11, 34 (24%) reported allergies/hay fever and 10 (7%) reported hypertension. Anxiety, depression and Post Traumatic Stress Disorder were reported by 5 (3.6%), 6 (4.3%) and 1(0.7%) respectively.

e. A total of 30 (18.5%) respondents reported a worsening of prior health problems and 61 (37.9%) reported new health problems, of which the majority (54%) were stress-related. Factors associated with increased risk of developing new/worsened health problems included participation at the Fresh Kills landfill, 2 or less confidants, being a civilian, military status (guard as apposed to active duty) and age.

f. Overall, 38 (23%) of respondents met the screening criteria for being at high risk for at least one of the following mental health outcomes: Post Traumatic Stress Disorder (PTSD), depression, alcohol abuse, generalized anxiety, and/or panic attacks. Factors significantly associated with development of mental health symptoms included age, status, number of confidants and history of prior mental health treatment.

g. Respondents with new/worsened health problems, and/or mental health symptoms were significantly more likely to request contact/information. Approximately 47% of respondents who noted either worsened/new health problems and/or mental health symptoms requested contact/information as compared to only 9% of respondents without the aforementioned condition(s).

7. Overall the WTCSHA was a success in the context that it was a concerted effort to reach out to the WTC rescue and recovery workers following the worst terrorist attack in American history. The WTCSHA provides a wealth of information for this unique support effort. This provides a baseline for investigations into possible long-term effects from a short-term exposure.

OCCUPATIONAL HEALTH OUTCOMES REPORT
NO. XX-XX-XXXX-03
World Trade Center Support Health Assessment Survey

1. INTRODUCTION

a. Background.

(1) On September 11, 2001 at approximately 0846 hours the hijacked American Airlines Flight 11 impacted between floors 94 and 99 of the north tower of the World Trade Center Complex. At approximately 0903, a second aircraft, United Airlines Flight 175 impacted between floors 78 and 84 of the South Tower. At 0959 the South Tower unexpectedly collapsed sending tons of dust and debris into the air. At 1028 the North Tower collapsed. The human toll from this terrorist attack included the killing of 92 passengers and crew on American Airlines Flight 11 and 65 on United Airlines flight 175. Approximately 2630 people died in the towers or on the ground when the towers collapsed.

(2) Damage to the World Trade Center was massive with the ultimate collapse of both the North and South towers and the collapse or demolition of several of the other buildings comprising the World Trade Center Complex. When the WTC collapsed, huge quantities of dust and debris filled the air causing large-scale inhalational hazards and mechanical injury to many in the vicinity of the WTC. In the face of this overwhelming disaster, assistance was brought into the area for across the country. Many of the personnel who came to assist were exposed to poorly characterize contaminants including concrete dust, asbestos, heavy metals, volatile organic hydrocarbons (VOCs) and human remains.

(3) Prior to the terrorist attacks on September 11, 2001, the largest number of fatalities from a terrorist attack in the United States was in Oklahoma City, when the Alfred P. Murrah Federal building was bombed on April 19, 1995 killing 168 Americans.¹ Immediately following that event the Oklahoma Commissioner of Health initiated a special study to examine the extent of injuries and related health conditions of survivors.² Other studies on the medical consequences of terrorist attacks and the development of survey instruments following these attacks have been reported in the literature³⁻⁸.

(4) In the aftermath of the events of September 11, 2001, the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) Commander, as the Army Functional Proponent for Preventive Medicine, was assigned direct responsibility for the development of a health assessment tool, the Pentagon Post-Disaster Health Assessment⁹ (WTCSHA). Both military and civilian Pentagon employees used this tool. Its purpose was two fold, to determine health needs and to determine what components of the remodeling of the pentagon had been successful in saving lives.

(5) The World Trade Center Support Health Assessment (WTCSHA) survey was initiated as an outreach program for all Department of the Army personnel (service members and Department of the Army civilians) who supported the rescue and relief efforts at the World Trade Center sites. It was intended to document injuries, illnesses, and exposures sustained by employees and to provide the opportunity to have their concerns addressed in the aftermath of the events of 11 September 2001.

b. Objective.

The objective of this technical report is to render an historical account of the actions taken in the development, deployment, and the initial analysis/evaluation of the WTCSHA survey. The analysis presented in this report is largely descriptive, focusing primarily on frequency distributions. A more detailed analysis employing hypothesis testing may be published in future technical reports.

2. METHODS.

The World Trade Center Support Health Assessment is a paper-based questionnaire based on the previous PPDHA and a survey developed for the Army Corps of Engineers and used for their WTC workers. The WTCSHA was distributed using the local Occupational Health clinics where possible and by direct mailings where no local occupational health clinic was available.

a. Survey Development.

(1) Immediately after the terrorist attacks on 9-11, several directorates in USACHPPM began supporting the World Trade Center rescue efforts with recommendations in the areas of personal protective equipment and monitoring. In October 2001, CHPPM was requested to recommend medical screening content and follow up frequency. It was later decided to offer the personnel who supported the WTC efforts a questionnaire similar to the questionnaire utilized as part of the Pentagon response, The Pentagon Post Disaster Health Assessment (PPDHA).

(2) The PPDHA survey was developed by a workgroup assembled at USACHPPM with Colonel Walter Egerton as the team leader. It is well described in *Population Health Outcomes Report No. 13-HG-7685-02, Pentagon, Washington DC*. The Army Corps of Engineers developed their own questionnaire for their employees that supported the WTC rescue and recovery efforts. Many of these workers worked on Ground Zero in the days immediately following the collapse. The WTCSHA was developed using a combination of the two surveys. The strength of the PPDHA survey included general exposure and validated psychological questions while the strength of the COE survey included the specifics of the WTC site and exposures.

(3) The Army Surgeon General made the official tasking for implementing the WTCSHA survey in support of Operation Noble Eagle.

b. Survey Question Refinement.

(1) The WTCSHA survey questions (**Appendix B**) were developed based on the PPDHA that had itself been developed from examples provided by the Centers for Disease Control and Prevention, which were formerly used after the Oklahoma City Bombing and instruments used in the follow-up after the Khobar Tower Bombing. Insights on injuries, adverse health impact, and psychological sequelae of the attack were the focus of the questions as had been reported in previous works on the impacts of terrorist attacks (**Appendix C**). Many of the survey questions were taken unchanged from the PPDHA, others were modified versions of those developed by the COE specifically for their WTC Rescue and Recovery workers. Many of the questions of the previous PPDHA were not applicable for these workers who arrived after the World Trade Center collapse since those questions were designed to detect injuries caused by the aircraft impact into the Pentagon, these questions were not used in the WTCSHA.

(2) Input was received from the U.S. Army Corps of Engineers, the Uniformed Services University of the Health Sciences (USUHS), the Walter Reed Army Institute of Research (WRAIR) Department of Psychiatry, the Directorate of Health Promotion and Wellness (DHPW) at USACHPPM, and from a TriService team of mental health consultants. A detailed description of the development of the questions contained in the mental health section of the survey with supporting documentation is available in the PPDHA report.

c. Survey Review and Approval.

(1) The WTCSHA was approved for use by the Human Subjects Research Review Board of the U.S. Army Medical Research and Materiel Command at Fort Detrick based on the survey's status as an outreach tool and public health surveillance tool, not a research instrument.

(2) If at some future point a decision is made to mine this data as part of a research project, an IRB would be required.

e. Survey Deployment.

(1) An initial list of Department of the Army personnel who had participated in the WTC effort was obtained from the Commander of the Defense Coordinating Element, COL Kevin Connors.

(2) A separate list of 249th Engineer Battalion personnel deployed to support the WTC was obtained from Mr. James Woodey of the COE.

(3) The surveys were distributed to the personnel in (1) and (2) above through the local Occupational Health Clinics where available. When this was not possible, the surveys were mailed to the participants and collected by return mail.

(4) The NJ ARNG developed a list of NJ ARNG participants and distributed the questionnaire by mail with a NJ ARNG cover letter. The questionnaires were then returned to the NJ ARNG and finally forwarded unopened to USACHPPM.

f. Survey Analysis.

Statistical Analysis. SPSS 10.1 was used for statistical analysis. Descriptive statistics were calculated and chi-square or Fisher's Exact tests were used to assess differences of association in distributions of respondents across the independent variables. Logistic Regression was utilized to examine which variables might be significant predictors of the outcome of interest. All statistical tests of significance were done at the two sided alpha 0.05 level.

3. Results.

a. Demographics.

(1) A total of 256 employees including 125 members of the NJ ARNG were asked to complete the survey, 162 responded, representing 63% of the total population.

(2) Over 86% of respondents were male and approximately 71% were represented in the 35 to 54 year old age group (**Table 1**). The majority (53%) of the respondents were Active Reserve or National Guard with civilian GS employees representing most of the remainder.

Table 1
Demographics of Respondents
(N=162)

	Respondents	Percentage of the Respondents
Age (years)		
Less than 25	12	7.4
25 to 34	41	25.3
35 to 44	58	35.8
45 to 54	40	24.7
55 to 64	11	6.8
Total	162	100
Gender		
Female	22	13.6
Male	140	86.4
Total	162	100
Status		
Active Duty	25	15.4
Active Reserve or National Guard	86	53.1
Civilian GS Employee	44	27.2
Civilian WG Employee	1	0.6
Civilian Contract Employee	4	2.5
Other	2	1.2
Total	162	100

b. Participation in Rescue/Recovery Efforts.

The majority (55%) of respondents indicated that they participated in the rescue and recovery efforts (**Table 3**).

Table 3
Participation in Rescue/Recovery Efforts
(N=159)

Location	Respondents	Percentage of the Respondents
Yes	88	55
No	71	45
Total	159	100.0
<i>Missing</i>	3	

c. Participation at Ground Zero

There were 34% of respondents that indicated they participated at ground zero (**Table 4**).

Table 4
Participation at Ground Zero
(N=157)

Location	Respondents	Percentage of the Respondents
Yes	54	34
No	103	66
Total	157	100.0
<i>Missing</i>	5	

d. Site Activities

The specific activities of the respondents were further delineated. The most common description was in the other category, of specific tasks, the most common were food service (24%) and Supervisory (20%) (**Table 5**).

Table 5
Work tasks performed during the World Trade Center Support Operations

Tasks	Respondents	Percentage of the Respondents
Other Tasks	98	60.5
Food Service	39	24.1
Supervisory	33	20.4
Security	31	19.1
Sanitation	28	17.3
Utilities Worker	13	8
Survey/Engineering	13	8
Traffic Control	9	5.6
Search and Rescue	8	4.9
Gas Powered tool operations	6	3.7
Hand digging	6	3.7
None	5	3.1
Firefighting	4	2.5
Bucket Brigade	2	1.2
Steel cutting/touch	0	0.
Total	-	100.0

Note: individuals may have indicated more than one task, so total exceeds 100%

e. Worksite Location

Each respondent was asked which location they worked at. The location choices were selected based on those used by the COE and are defined as:

- (a). *Within Exclusion Zone— (collapsed remains/debris at WTC Complex Within Ground Zero)*
- (b). *Outside Exclusion Zone—(edge of the collapsed remains/Outside exclusion area but within five blocks of Ground Zero)*
- (c.). *DTOS —(Deployable Tactical Operations System)*
- (d). *Land Fill- Fresh Kills Land Fill*
- (e). *Other (Please specify)*

When asked where which location they worked at, the majority of respondents reported working at the Fresh Kills Landfill (**Table 6**). This corresponds to the large percentage of respondents that belonged to the NJ ARNG. A total of 51 (31.5%) had worked within the exclusion zone at Ground Zero. Many

respondents worked at more than one location therefore the total responses (233) exceeded the total number that completed the survey (162).

Table 6
Work Location in WTC Support

Locations	Number working at location		Categorized number of Hours worked at location by respondent			
	Number	Percent	1-20 hrs	21-40 hrs	41-60 hrs	60+ hrs
Within Exclusion Zone	51	31.5	23	10	8	10
Outside Exclusion Zone	39	24.1	24	6	2	7
DTOS	12	7.4	5	2	1	4
Fresh Kills Landfill	96	59.3	11	6	8	67
Highland Dock	14	8.6	13	0	0	0
Other	21	13.0	9	2	0	5
Total	233	144%				

Note: individuals may have indicated more than one location, so total exceeds 100%

f. Worksite Exposures

Each of the respondents were asked to describe their exposures (smoke/dust/fumes) at each of the worksite locations. Additionally they were asked the percentage of the time they wore a respirator. Most of the respondents reported wearing respirators at least part of the time. Within the exclusion zone, 50 of 51 respondents report using a respirator at least part of the time (**Table 7**). The specific dates worked at each site and the types of respirators used was not requested.

Table 7
Work Place Exposures in WTC Support

Locations	Number exposed to smoke, dust, chemicals/fumes		Percent of time wearing respirator at location			
	Number	Percent	0-25%	26-50%	51-75%	76-100%
Within Exclusion Zone	50	98	14	9	6	9
Outside Exclusion Zone	29	74	27	7	0	5
DTOS	8	66	10	1	0	0
Fresh Kills Landfill	90	94	58	16	7	9
Highland Dock	13	93	10	0	2	1
Other	9	22	12	0	0	1
Total	199					

Note: individuals may have indicated more than one location, so total exceeds 100%

g. **Prior Exposures** Toxicological exposures can be accumulative both from day to day workplace exposures, and from non-workplace exposures such as hobbies and the home environment in general. Hobby activities were included in the questionnaire with home renovation being the most common (a common source of lead exposure in older homes) (**Table 8**).

Table 8
Hobbies or Activities

Hobby or Activity	Pre 9-11 Number (%)	Post 9-11 Number (%)
Auto mechanic/body work	26 (23.4)	22 (20.8)
Bird raising/animal rearing	8 (7.2)	7 (6.6)
Hobby farming/gardening	32 (28.8)	26 (24.5)
Home renovation	46 (41.4)	44 (41.5)
Painting (home/apartment/commercial)	38 (34.2)	33 (31.1)
Soldering	23 (20.7)	21 (19.8)
Stain glass production	1 (0.9)	1 (.9)
Target shooting	25 (22.5)	20 (18.9)
Welding	5 (4.5)	4 (3.8)
Woodworking	29 (26.1)	28 (26.4)
Other	35 (31.5)	29 (27.4)

h. Prior Health.

(1) The majority (55.7%) of respondents had no reported health problems prior to the WTC World Trade Center support operations (**Table 8**). Of the reported health problems, allergies/hay fever was the most common (24.3%) with anxiety (9.3%) and depression (4.3) also being prominent.

Table 9
Health complaints in the 12 months PRIOR to 9-11

Health Conditions	Respondents	Percentage of the Respondents
No health problems	78	55.7
Allergies/Hay fever	34	24.3
High Blood Pressure	10	7.1
Other, not listed	13	9.3
Anxiety	5	3.6
Depression	6	4.3
Asbestosis	1	0.7
Chronic Bronchitis	3	2.1
Angina	2	1.4
Heart Arrhythmia	4	2.9
Asthma	3	2.1
Emphysema	0	0
Pneumonia	0	0

Tuberculosis	0	0
Silicosis	0	0
Pneumothorax	0	0
Liver Disease	0	0
Heart World Trade Center support operations	0	0
Stroke	0	0
Heart Failure	0	0
Swelling in legs	1	0.7
Multiple Chemical Sensitivity	0	0
Post Traumatic Stress Disorder	1	0.7

(2). **Smoking History.** Most of the respondents (87) have never smoked (**Table 10**). Of those who smoked, most (36) have smoked over 5 years (**Table 11**).

Table 10
Smoking History
(N=162)

Do you currently smoke	Respondents	Percentage of the Respondents
Never	87	53.7
Yes	64	39.5
Former	11	6.8

Table 11
Duration of Smoking
(N=62)

Do you currently smoke	Respondents	Percentage of the Respondents
YES	64	
The past 6 months only	3	4.8
The past 12 months	6	9.7
The past 1-5 years	17	27.4
Over 5 years	36	58.1
Missing	2	

i. **Environmental Exposures.** Environmental Exposures as a result of WTC support operations were described. Most of the respondents reported exposures to dust (142) or chemicals/fumes (108), with a minority reporting exposure to smoke (71) **Table 12**. Of the 154 who reported airborne exposures, most reported exposure to more than one contaminate.

Table 12
Exposure to Dust, Chemicals/Fumes, and Smoke
(N=162)

Exposure	Respondents	Percentage of the Respondents
Dust	142	87.7
Chemicals/Fumes	108	66.7
Smoke	71	43.8
<i>None of the above</i>	<i>8</i>	<i>4.9</i>

Of the respondents indicating that they had been exposed to dust, chemicals/fumes or smoke (154) the majority of exposures were perceived as being light (**Table 13**) with duration of over 31 hours (**Table 14**).

Table 13
Thickness of Exposure for Respondents
(N=154)

Intensity of Exposure	Total Number Responding	Light	Medium	Heavy
Dust	141	71 (50.4%)	49 (32.6%)	24 (17%)
Chemicals/Fumes	107	37 (34.6%)	44 (41.1%)	26 (24.3%)
Smoke	70	42 (60%)	24 (34.3%)	4 (5.7%)

Table 14
Duration of Exposure for Respondents
(N=154)

Duration of Exposure	Total Number Responding	0-10 hours		11-20 hours		21-30 hours		31 + hours	
		#	%	#	%	#	%	#	%
Dust	131	30	(22.9%)	10	(7.6%)	13	(9.9%)	78	(59.5%)
Chemicals/Fumes	99	25	(25.3%)	4	(4.0%)	6	(6.1%)	64	(64.6%)
Smoke	65	28	(43.1%)	8	(12.3%)	8	(12.3%)	21	(32.3%)

j. Health Status

(1) Out of the total population (N=158), survey respondents listed their place of usual medical care as indicated in **Table 15**. The majority of respondents received care from a personal civilian provider.

Table 15
Primary location for Health Care
(N=158)

Location	Number	Percent
Military Treatment Facility (MTF)	34	21.5
Civilian Treatment Facility (CTF)	36	22.8
Personal (civilian) Medical Provider (PMP)	67	42.4
Other	1	0.6
MTF + CTF	5	3.2

MTF + PMP	3	1.9
CTF + PMP	9	5.7
MTF + CTF + PMP	3	1.9

(2) **Health Problems or Concerns** The majority (62.1%) of respondents reported no new health problems or concerns since WTC support operations began and 81.5% reported no worsened old health problems or concerns as a result of their WTC rescue and recovery activities (**Table 16**). Some respondents reported both old health problems or concerns and new health problems or concerns. Overall 70 (43%) of responders reported some type of new and /or worsened health problem or concerns since the World Trade Center support operations. This includes respondents who gave conflicting responses (i.e., answering “no” to both question 19 and 20, but indicating otherwise on follow-up health questions where they listed their new/worsened health problems).

Table 16
Health Problems or Concerns of Respondents
(N=162)

Worsened Old Health Problems or Concerns	Respondents	Percentage of the Respondents
No	132	81.5
Yes	30	18.5
Total	162	100.0
No Response	0	
New Health Problems or Concerns	Respondents	Percentage of the Respondents
No	100	62.1
Yes	61	37.9
Total	161	100
No Response	1	

(3) **Nature of health problems or concerns** Based on positive responses to either question pertaining to a worsening of old health problems or the development of new health problems since their participation in the WTC support attack the respondents were requested to fill out questions describing their new or worsened health problems (**Appendix B, Section C**).

(4) **Pulmonary Symptoms** A total of 87 respondents answered this question even though only 70 had reported any new or worsened health problems. Among the 70 respondents who reported a worsening of old health problems and/or the development of new health problems since the World Trade Center support operations 50 (43.4%) reported pulmonary symptoms (**Table 17**).

Table 17
Pulmonary Symptoms
(N=87)

Pulmonary symptom	Respondents	Percentage of the
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		Respondents
Not experiencing any pulmonary symptoms	37	42.5
Pulmonary Symptom not listed	18	20.7
Shortness of breath with walking	12	13.5
Early morning cough that wakes you up	16	18.4
Chest pain with deep breathing	14	16.1
A cough that occurs mostly lying down	15	17.2
Shortness of breath that interferes with job	11	12.6
A cough that produces phlegm	21	24.1
Have coughed up blood	1	1.1
Wheezing that interferes with job	5	5.7

(5) Identification of new or worsened health problems or concerns.

There were 70 (43%) of responders who reported some type of new or worsened health problem since the World Trade Center support operations. This includes respondents who gave conflicting responses (i.e., answering “no” to both question 19 and 20, but indicating otherwise on follow-up health questions where they listed their new/worsened health problems). The most common new or worsened health problem reported was cough (56%) and breathing problems (41%). There were 16 (17.8%) that reported their health problems/concerns were stress related. Headaches and irritated eyes, nose and throat were also prevalent (**Table 18**).

Table 18
Identification of New/Worsened Health Problems or Concerns of Respondents (N=70)

Old/New Health Problems or Concerns	Respondents	Percentage of the Respondents
Cough	39	55.7
Breathing Problems	29	41.4
Irritated eyes, nose or throat	24	34.3
Headaches	19	27.1
Stress related	16	22.9
Injuries	4	5.7
Burns	0	0
Hearing	3	4.3
Other not listed	20	28.6

(6) Relationship between health status and location. There was an association between reported development of new health problems and/or worsened old health problems following the terrorist attack and respondents location (**Table 19**). Statistically significant differences are highlighted in red.

Table 19
Identification of New/Worsened Health Problems by Location (N=90)

What new or worsened health probs have you noted?

	Fresh Kills Landfill				Other Locations			
	N	Percent	95%-L-CI	95%-U-CI	N	Percent	95%-L-CI	95%-U-CI
Have not noted new or worsened health problems	9	(14.5)	10.0%	19.0%	11	(39.3)	30.1%	48.5%
Other new or worsened health problems not listed	15	(24.2)	18.8%	29.6%	5	(17.9)	10.6%	25.1%
Cough	32	(51.6)	45.3%	58.0%	7	(25.0)	16.8%	33.2%
Breathing problems	22	(35.5)	29.4%	41.6%	7	(25.0)	16.8%	33.2%
Irritated eyes, nose, or throat	20	(32.3)	26.3%	38.2%	4	(14.3)	7.7%	20.9%
Head aches	15	(24.2)	18.8%	29.6%	4	(14.3)	7.7%	20.9%
Stress-related	14	(22.6)	17.3%	27.9%	2	(7.1)	2.3%	12.0%
Injuries	4	(6.5)	3.3%	9.6%	0	(0.0)	0.0%	0.0%
Burns	0	(0.0)	0.0%	0.0%	0	(0.0)	0.0%	0.0%
Hearing	3	(4.8)	2.1%	7.6%	0	(0.0)	0.0%	0.0%

Note: Only 62 individuals working at Fresh Kills and 28 individuals working at Other Locations responded to this question. Conditions that significantly differed between both groups are highlighted in red.

(8) Only 14 respondents indicated that problems were still present at the time of the survey. Health problems still present at the time of the survey are indicated in **Table 19**.

Table 19
New/Worsened Health Problems Still Present Among Respondents
(N=162)

Problems still present	Respondents	Percentage of the Respondents
Injuries	0	0
Burns	0	0
Breathing problems	5	35.7
Irritated eyes, nose, or throat	3	21.4
Hearing problems	0	0
Other	6	42.9
Total	14	100.0

(9) **Date of symptom onset.** The respondents were asked to describe the date their symptoms appeared. The actual dates of participation were not requested. The range of responses was 10 September 2001 (the day before the World Trade Center support operations) to 15 December 2002 (**Figure 1**).

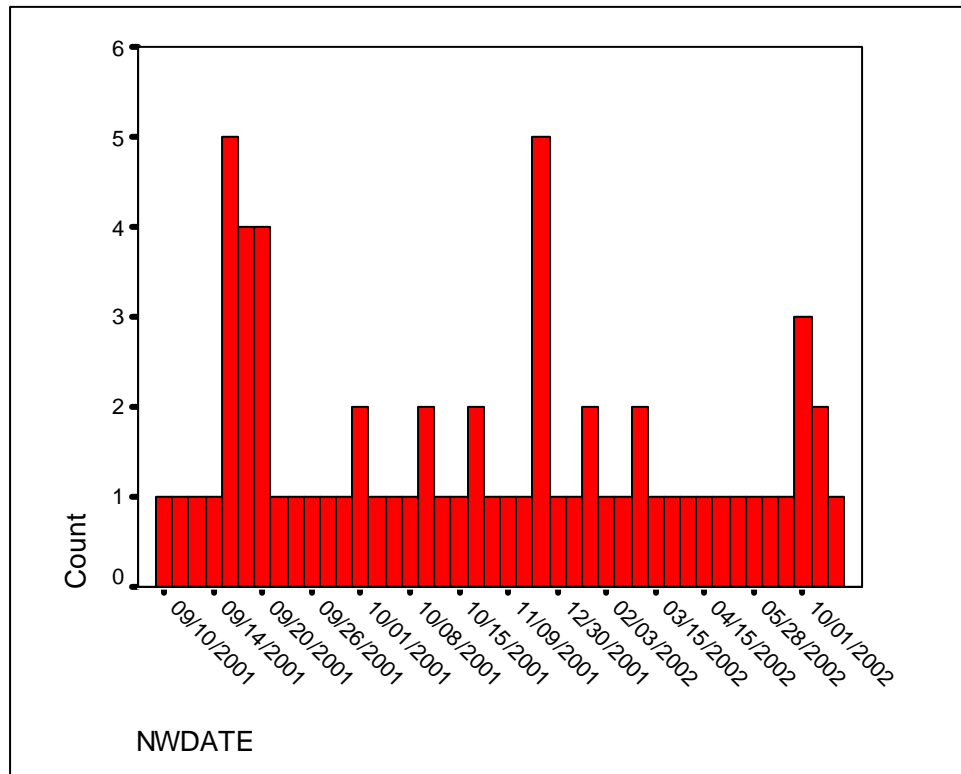


Table 20 shows the range of days after the World Trade Center attack for onset of symptoms by quartiles. A closer review of the data, comparing the date the form was completed to the date of symptom onset, showed that 7 individuals reported dates of symptom onset that were after the date the form was completed. The most probable reason for this is miss-stating the year. The events occurred in the 4th quarter of 2001 but the questionnaire was completed in 2002. The third column of **Table 20** shows the data with the incorrect onset of symptom dates deleted. One quarter of respondents reported the onset of symptoms within 9 days, with another quarter within 29 days. The mean was 70.4 with a median of 29 and modes 4 and 71 days. The 4th column uses all of the data with the date of onset adjusted to that it was in 2001. The date range of the quartiles with deleted data and adjusted data match closely, supporting the use of corrected data.

Table 20
Quartiles by Reported Days to First Symptoms

	Data with date as submitted	Incorrect data deleted	Submitted data with year adjusted
1 st quartile	0-9 days	0-9 days	0-9 days
2 nd quartile	9-50 days	9-29 days	9-29 days
3 rd quartile	50-152	29-110 days	33-81 days
4 th quartile	152-460	112-264	110-264
Total Number	64	57	64
Note: Only 64 answered this question, column 1 includes 7 questionnaires with dates of symptom onset after the date questionnaire was completed, and the most likely cause is using 2002 instead of 2001 as the year. The 3rd column has those dates deleted, and column 4 has the years adjusted to 2001.			

k. **Injuries.** Although 72 respondents answered this question, 55 reported no new injuries. Of those who identified injuries as a new/worsened health problem since the WTC response, 17 (10%) of the population sampled (N=162) indicated a type of injury sustained. The distribution of injury types is identified in **Table 23**. They are listed as a percent of the total number of responders, and as a percent of injured responders.

Table 23
Type of Injuries Among Respondents
(N=162)

Type of Injuries	Total Respondents (N=162)	Percentage of Total Respondents	Injured Respondents (N=17)	Percentage of Injured Respondents
Was cut or received a laceration	8	5	8	47.0
Received a bruise	4	2.5	4	23.5
Developed a hearing problem	3	2	3	17.6
Vision problems	3	2	3	17.6
Received an abrasion	1	0.6	1	0.6
Was burned	1	0.6	1	0.6
Broken Bones	0	0	0	0
Concussion/head injury	0	0	0	0
Other Problems	8	5	5	47.0
Total Injuries (any of the above)	17	10	25*	147*
Not Injured	55	90	2	N/A
Total	72	100.0	127	100.0
*Note: Many of the respondents who reported injuries listed more than one type of injury, so number of injuries exceed number of injured				

j. Mental Health

(1) Most of the questions used in the mental health portion of the questionnaire were taken from the PPDHA survey. The origin and development of the questions and scales are discussed in detail in Appendix F.

(2) The mental health domains of interest chosen for the survey included Post Traumatic Stress Disorder (PTSD), depression, alcohol abuse, generalized anxiety, panic attacks, an overall measure of mental health functioning, and key risk/protective factors considered to be most important following a terrorist attack (e.g., loss of friend or co-worker, prior mental health care use, prior trauma, and social support). Although there are a number of standardized psychological instruments that could have been used, they were deemed too long and time consuming to use in totality for this survey.

(4) While the questionnaire was not designed to make specific mental disorder diagnoses, it is possible to discern high-risk groups for each of the mental health symptom domains and perform subgroup analysis (see Appendix F for details of scale development). Overall, 38 (24%) of respondents met the screening criteria for being at high risk for at least one of these mental health outcomes (i.e. PTSD, depression, alcohol abuse, generalized anxiety, and/or panic attacks), as is indicated in **Table 24**. Specific results for each of the four domains of interest (PTSD, Depression, Alcohol Abuse, and Generalized Anxiety) follow in **Table 24a** through **Table 24e**.

Table 24
Number of Individuals at High Risk for Mental Health Outcomes
(N=162)

Mental Health Outcomes	Respondents	%
No	124	(76.5)
Yes	38	(23.5)
<i>Total</i>	162	(100.0%)

Table 24a
Number of Individuals at High-Risk for PTSD
(N=162)

PTSD	Respondents	%
No	145	(89.5)
Yes	17	(10.5)
<i>Total</i>	162	(100.0%)

Table 24b

**Number of Individuals at High-Risk for Depression
(N=162)**

Depression	Respondent	%
No	135	(83.3)
Yes	27	(16.7)
<i>Total</i>	162	(100.0%)

**Table 24c
Number of Individuals at High-Risk for Alcohol Abuse
(N=162)**

Alcohol Abuse	Respondent	%
No	158	(97.5)
Yes	4	(2.5)
<i>Total</i>	162	(100)

**Table 24d
Number of Individuals at High-Risk for Generalized Anxiety
(N=162)**

Generalized Anxiety	Respondent	%
No	137	(84.6)
Yes	25	(15.4)
<i>Total</i>	162	(100.0)

**Table 24e
Number of Individuals at High-Risk for Panic Attacks
(N=162)**

Panic Attacks	Respondents	%
No	138	(85.2)
Yes	24	(14.8)
<i>Total</i>	162	(100.0)

(5) **Table 25** through **Table 30** describe the self-reported levels of daily functioning in relation to each high risk grouping. Those screening positive for PTSD, depression, generalized anxiety, and panic attacks self-report significantly more difficulty performing daily functions. Although an odds ratio could not be calculated for alcohol use in relation to impairment (see **Table 31**), **Table 27** shows that for those self-reporting alcohol abuse, all four self-reported "Quite a lot" of impairment in daily functioning (Chi-Square = 19.6; p-value <.001).

Table 25
Daily Functioning Levels of Respondents by PTSD Screen
(N=161)

Impact on Daily Functioning	PTSD Positive Screen		PTSD Negative Screen	
	N	%	N	%
Not at all	1	(6.3)	93	(64.1)
Very little	1	(6.3)	38	(26.2)
Somewhat	6	(37.5)	9	(6.2)
Quite a lot	7	(43.8)	4	(2.8)
Could not do daily activities	1	(6.3)	1	(0.7)

Table 26
Daily Functioning Levels of Respondents by Depression Screen
(N=161)

Impact on Daily Functioning	Depression Positive Screen		Depression Negative Screen	
	N	%	N	%
Not at all	2	(7.7)	92	(68.1)
Very little	5	(19.2)	34	(25.2)
Somewhat	8	(30.8)	7	(5.2)
Quite a lot	10	(38.5)	1	(0.7)
Could not do daily activities	1	(3.8)	1	(0.7)

Table 27
Daily Functioning Levels of Respondents by Alcohol Abuse Screen
(N=161)

Impact on Daily Functioning	Alcohol Abuse Screen Positive		Alcohol Abuse Screen Negative	
	N	%	N	%
Not at all	0	n/a	94	(59.9)
Very little	0	n/a	39	(24.8)
Somewhat	0	n/a	15	(9.6)
Quite a lot	4	(100.0)	7	(4.5)

Could not do daily activities	0	n/a	2	(1.3)
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Table 28
Daily Functioning Levels of Respondents by Generalized Anxiety Screen
(N=161)

Impact on Daily Functioning	Generalized Anxiety Screen Positive		Generalized Anxiety Screen Negative	
	N	%	N	%
Not at all	3	(12.5)	91	(66.4)
Very little	4	(16.7)	35	(25.5)
Somewhat	7	(29.2)	8	(5.8)
Quite a lot	8	(33.3)	3	(2.2)
Could not do daily activities	2	(8.3)	0	n/a

Table 29
Daily Functioning Levels of Respondents by Panic Attack Screen
(N=161)

Impact on Daily Functioning	Panic Attack Screen Positive		Panic Attack Screen Negative	
	N	%	N	%
Not at all	2	(8.7)	92	(66.7)
Very little	5	(21.7)	34	(24.6)
Somewhat	7	(30.4)	8	(5.8)
Quite a lot	8	(34.8)	3	(2.2)
Could not do daily activities	1	(4.3)	1	(0.7)

Table 30
Daily Functioning Levels of Respondents by
Mental Health Outcome Screen
(N=161)

Impact on Daily Functioning	Mental Health Screen Positive		Mental Health Screen Negative	
	N	%	N	%
Not at all	5	(13.5)	89	(71.8)
Very little	9	(24.3)	30	(24.2)
Somewhat	11	(29.7)	4	(3.2)
Quite a lot	10	(27.0)	1	(0.8)
Could not do daily activities	2	(5.4)	0	(n/a)

(6) **Table 31** shows the Odds Ratios for each of the domains of interest. The odds ratio is the ratio of the relative risk that the event occurs to the relative risk that the event does not occur (10). Belonging to a high-risk group places one at significant risk of functional impairment. Those in any of the mental health risk groups are 36 times more likely than those not in any mental health risk group to experience significant impairment in daily functioning.

Table 31
Association of Belonging to High-Risk Group and Impact on Daily Function
("Somewhat" or more Impairment vs. "No" or "Very Little" Impairment)
(N=161)

Mental Health Outcome	OR	(95% CI)	p-value
PTSD	43.7	(11.7 - 170.7)	0.0001
Depression	33.3	(11.4 - 96.7)	0.0001
Generalized Anxiety	24.3	(8.6 - 69.0)	0.0001
Panic Attacks	21.0	(7.5 - 59.1)	0.0001
Any Mental Health Outcome	36.5	(12.1 - 110.3)	0.0001

Note: Odd Ratio for Alcohol Abuse could not be calculated

(7) **Table 32** presents the odds ratios of some selected demographic risk factors in relation to specific mental health factors of interest. Those that are significant are marked in red and asterisked.

(a) Those age 35 and older were at greater risk of suffering a negative mental health outcome, particularly depression and/or panic attacks.

(b) Military (active duty) respondents were at greater risk of suffering a negative mental health outcome, particularly depression.

(c) Those who felt they had fewer than three people in whom they could confide were at greater risk of suffering a negative mental health outcome. This was true across all mental health domains of interest.

(d) Those who had a prior history of mental health treatment were at greater risk for panic attacks. They were also likely to be at higher risk for suffering a negative mental health outcome in general, though this assertion is statistically marginal.

(e) Gender differences, history of prior trauma, and knowing someone killed or seriously injured were not statistically significant factors in any of the mental health risk domains.

Table 32
Mental Health Risk Factor Analysis

Risk Factors	Crude Odds Ratio (95% CI)					
	PTSD	Depression	Alcohol Abuse	Gen. Anxiety	Panic Attacks	Any Mental Health Outcomes
Gender (M:F)	1.4 (0.4-5.4)	0.7 (0.2-2.8)	n/a	0.8 (0.2-3.1)	1.3 (0.4-4.3)	0.7 (0.2-2.2)
Age (<35:≥35)	1.7 (0.5-5.4)	4.7 (1.3-16.4)*	n/a	2.2 (0.8-6.1)	4.0 (1.1-14.0)*	2.6 (1.1-6.4)*
Status (Civilian:Military)	3.8 (0.8-17.4)	4.4 (1.3-15.4)*	1.4 (0.1-13.7)	4.0 (1.1-13.9)	2.6 (0.8-8.0)	5.2 (1.7-15.6)*
Prior Trauma (Y:N)	1.1 (0.4-3.4)	1.2 (0.5-2.9)	8.6 (0.9-84.6)	0.8 (0.3-2.2)	1.1 (0.4-2.9)	1.3 (0.6-2.9)
Know dead/SI (Y:N)	0.3 (0.1-1.5)	1.0 (0.4-2.5)	n/a	0.5 (0.2-1.5)	0.7 (0.2-1.9)	0.7 (0.3-1.6)
Confidants (≤2:>2)	4.6 (1.5-13.7)*	8.0 (3.0-21.4)*	n/a	9.0 (3.2-25.7)*	6.4 (2.4-17.3)*	6.2 (2.8-13.9)*
Hx of prior MH tx (Y:N)	2.9 (0.9-9.3)	2.7 (1.0-7.5)	2.0 (0.2-20.6)	2.4 (0.8-6.8)	4.1 (1.5-11.1)*	2.5 (1.0-6.4)

Risk Factors	Adjusted Odds Ratio (95% CI)					
	PTSD	Depression	Alcohol Abuse	Gen. Anxiety	Panic Attacks	Any Mental Health Outcomes
Gender (M:F)	1.6 (0.4-7.0)	1.1 (0.2-4.8)	n/a	1.1 (0.2-4.6)	1.7 (0.4-6.6)	0.9 (0.2-3.1)
Age (<35:≥35)	2.2 (0.6-7.5)	7.5 (1.9-30.0)*	n/a	3.1 (1.0-10.0)	6.4 (1.6-25.2)*	3.7 (1.3-10.3)*
Status (Civilian:Military)	3.3 (0.7-16.0)	4.8 (1.2-19.6)*	n/a	3.5 (0.9-13.9)	2.4 (0.7-8.6)	5.1 (1.6-16.8)*
Prior Trauma (Y:N)	0.8 (0.2-2.6)	0.6 (0.2-2.0)	n/a	0.5 (0.2-1.6)	0.6 (0.2-2.0)	0.8 (0.3-2.2)
Know dead/SI (Y:N)	2.1 (0.4-10.1)	0.5 (0.1-1.5)	n/a	1.3 (0.4-4.6)	0.9 (0.3-3.0)	0.8 (0.3-2.3)
Confidants (≤2:>2)	4.1 (1.3-12.9)*	10.0 (3.3-30.4)*	n/a	8.6 (2.8-26.1)*	7.5 (2.5-22.5)*	6.3 (2.6-15.4)*
Hx of prior MH tx (Y:N)	2.2 (0.6-7.6)	2.3 (0.7-7.9)	n/a	1.9 (0.6-6.1)	3.5 (1.1-11.4)*	2.0 (0.7-6.1)

Risk Factors	Adjusted Odds Ratio (95% CI) - Using Backwards Stepwise Regression					
	PTSD	Depression	Alcohol Abuse	Gen. Anxiety	Panic Attacks	Any Mental Health Outcomes
Gender (M:F)	xxxxxxx	xxxxxxx	n/a	xxxxxxx	xxxxxxx	xxxxxxx
Age (<35:≥35)	xxxxxxx	6.8 (1.8-25.6)*	n/a	xxxxxxx	5.5 (1.4-20.9)*	3.8 (1.4-10.1)*
Status (Civilian:Military)	xxxxxxx	4.1 (1.1-15.6)*	n/a	xxxxxxx	xxxxxxx	5.1 (1.6-16.3)*
Prior Trauma (Y:N)	xxxxxxx	xxxxxxx	n/a	xxxxxxx	xxxxxxx	xxxxxxx
Know dead/SI (Y:N)	xxxxxxx	xxxxxxx	n/a	xxxxxxx	xxxxxxx	xxxxxxx
Confidants (≤2:>2)	4.7 (1.4-12.7)*	8.3 (2.9-23.3)*	n/a	8.6 (3.0-24.6)*	7.3 (2.6-20.7)*	6.3 (2.7-14.9)*
Hx of prior MH tx (Y:N)	xxxxxxx	xxxxxxx	n/a	xxxxxxx	3.8 (1.2-11.7)*	xxxxxxx

*items (asterisked/in red) indicate a significant odds ratio; xxxxxxx= insignificant covariate

(8) Thirty-one respondents (19%) reported seeking mental health care post-exposure. Those in a mental health high-risk group were five times more likely to have sought care (**Table 36**). Other factors such as age, gender, or serving in an active-duty military status were not significant factors in who sought mental health care post-exposure (**Tables 33, 34, & 35**).

Table 33
Number of Individuals Seeking Mental Health Counseling
Following Operational Exposure by Status
(N=162)

Sought Counseling Following Attack	Military (N=111)		Civilian (N=51)	
	N	%	N	%
Yes	26	(23.4%)	5	(9.8%)
No	85	(76.6%)	46	(90.2%)

p-value = 0.41; OR(Military:Civilian) = 2.81 (1.01 - 7.82)

Table 34
Number of Individuals Seeking Mental Health Counseling
Following Operational Exposure by Age
(N=162)

Sought Counseling Following Attack	<35 years (N=53)		≥ 35 years (N=109)	
	N	%	N	%
Yes	10	(18.9%)	21	(19.3%)
No	43	(81.1%)	88	(80.7%)

p-value = 0.952; OR(<35:≥35) = 1.02 (0.44 - 2.37)

Table 35
Number of Individuals Seeking Mental Health Counseling
Following Operational Exposure by Gender
(N=162)

Sought Counseling Following Attack	Male (N=139)		Female (N=22)	
	N	%	N	%
Yes	25	(17.9%)	6	(27.3%)
No	115	(82.1%)	16	(72.7%)

p-value = 0.297; OR(Male:Female) = 1.73 (0.61 - 3.85)

Table 36

**Number of Individuals Seeking Mental Health Counseling
Following Operational Exposure by Mental Health Outcome
(N=162)**

Sought Counseling Following Attack	Mental Health Outcome Screen Positive (N=38)		Mental Health Outcome Screen Negative (N=124)	
	N	%	N	%
Yes	16	(42.1%)	15	(12.1%)
No	22	(57.9%)	109	(87.9%)

p-value < 0.001; OR(Postive:Negative) = 5.3 (2.3 - 12.2)

(9) A number of respondents complained of or were concerned about a variety of issues (see **Table 38**). Of those concerned, some requested they be contacted in order to further discuss these issues.

(a) Of the complaints/concerns noted, about a quarter involved environmental exposure concerns, about a quarter involved mental health concerns, and about a fifth involved somatic complaints (**Table 37**).

(b) On average, three-quarters of those listing complaints/concerns also asked to be contacted. The exception to this was those who noted "other" concerns or issues—only 29% of them asked to be contacted (see **Tables 37 and 38**).

**Table 37
Types of Complaints and Concerns of Respondents**

General Categories of Complaints and Concerns	Number Received (N=37)	Percentage of Responders	Number Concerned Requesting Info/Contact (N=24)	Percentage of Concerned Requesting Info/Contact
Environmental Health	10	(27.0%)	7	(70.0%)
Mental Health	9	(24.3%)	7	(77.8%)
Somatic	7	(18.9%)	5	(71.4%)
Administrative	4	(10.8%)	3	(75.0%)
Other	7	(18.9%)	2	(28.6%)

**Table 38
General Categories of Complaints and Concerns**

General Category	Identified Complaints and Concerns
Environmental Health	Exposure to dust, fumes, smoke, asbestos and noise

Somatic	Breathing difficulty; Increased allergies; headaches; nose bleeds; Chest pain; Leg pain; Back pain; food poisoning; black bump on leg (left a scar); became very ill; weight loss
Administrative	Lack of hearing tests and mental health services for NG; told not to wear Tyvek suits and breathing masks
Other	Current medications unrelated to WTC support; where located; services not needed; financial burden of deployment; past desert illness treatment; reasons of lack of trauma
Mental Health	Emotional, anxiety, depression, sleeping problems, memory problems, marijuana addiction, alcohol dependence, eating a lot; inability to grieve due to duties as chaplain

(c) **Tables 39-46** present data on those seeking further contact. Military personnel were about three and a half times more likely to request further contact than civilian personnel (**Table 39**). Those who screened positive for a mental health problem or self-reported having new or worsened health problems were over eight times more likely to seek further contact (**Tables 42 & 43**). Differences in gender, age, and number of confidants did not prove to be significant indicators of who sought further contact (**Tables 40, 41, 44**). **Table 46** presents data showing that those who sought further contact were fourteen times more likely to have screened positive for a mental health high risk factor or self-reported new/worse health problems.

Table 39
Number of Individuals Requesting to be Contacted by Status
(N=161)

Requested to be Contacted	Military (N=110)		Civilian (N=51)	
	N	%	N	%
Yes	36	(32.7%)	6	(11.8%)
No	74	(67.3%)	45	(88.2%)

p-value = 0.005; OR(Military:Civilian) = 3.65 (1.43 - 9.34)

Table 40
Number of Individuals Requesting to be Contacted by Age
(N=161)

Requested to be Contacted	<35 years (N=52)		≥ 35 years (N=109)	
	N	%	N	%
Yes	9	(17.3%)	33	(30.3%)
No	43	(82.7%)	76	(69.7%)

p-value = 0.08; OR(<35:≥35) = 2.08 (0.91 - 4.74)

Table 41
Number of Individuals Requesting to be Contacted by Gender
(N=161)

Requested to be Contacted	Male (N=139)		Female (N=22)	
	N	%	N	%
Yes	37	(26.6%)	5	(22.7%)
No	102	(73.4%)	17	(77.3%)

p-value = 0.70; OR(Male:Female) = 0.81 (0.28 – 2.35)

Table 42
Number of Individuals Requesting to be Contacted
by Mental Health Outcome Screen
(N=161)

Requested to be Contacted	Mental Health Outcome Screen Positive (N=38)		Mental Health Outcome Screen Negative (N=123)	
	N	%	N	%
Yes	23	(60.5%)	19	(15.4%)
No	15	(39.5%)	104	(84.6%)

p-value < 0.001; OR(Positive:Negative) = 8.39 (3.72 – 18.94)

Table 43
Number of Individuals Requesting to be Contacted
by New or Worsened Health Problems
(N=161)

Requested to be Contacted	Worsened or New Health Problems (N=72)		No Worsened or New Health Problems (N=89)	
	N	%	N	%
Yes	34	(47.2%)	8	(9.0%)

No	38	(52.8%)	80	(91.0%)
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p-value = 0.001; OR(Yes:No) = 8.95 (3.78 – 21.18)

Table 44
Number of Individuals Requesting to be Contacted
by Number of Confidants
(N=161)

Requested to be Contacted	≤ 2 Confidants (N=61)		>2 Confidants (N=100)	
	N	%	N	%
Yes	20	(32.8%)	22	(22.0%)
No	41	(67.2%)	78	(78.0%)

p-value = 0.131; OR(≤2:>2) = 1.73 (0.85 – 3.53)

Table 45
Analysis of Demographics/Outcomes of Individuals Desiring Contact

Factor	Crude OR (95% CI)	Adjusted OR (95% CI)	Adjusted OR Using backwards stepwise regression (95% CI)
Gender (F:M)	0.8 (0.3-2.4)	0.6 (0.2-2.2)	xxxxxx
Age (≥35:<35)	2.1 (0.9-4.7)	1.2 (0.4-3.3)	xxxxxx
Status (Military:Civilian)	3.6 (1.4-9.3)*	1.7 (0.6-5.0)	xxxxxx
Exposure (Y:N)	3.8 (0.5-30.3)	3.0 (0.3-30.0)	xxxxxx
Worsened/New Health Probs (Y:N)	9.1 (3.8-21.4)*	5.5 (2.0-14.7)*	5.5 (2.2-13.9)*
Mental Health Outcome (Y:N)	8.4 (3.7-18.9)*	4.6 (1.6-12.7)*	4.4 (1.8-10.6)*
Confidants (≤2:>2)	1.7 (0.8-3.5)	0.6 (0.2-1.7)	xxxxxx

*items (asterisked/in red) indicate a significant odds ratio; xxxxxx= insignificant covariate

Table 46
Mental Health Outcome vs. Requests for Contact
(N=161)

Requested to be Contacted	Yes, New/Worsened Health Problems (or) Mental Health Symptoms Screen Positive		No New/Worsened Health Problems (or) Mental Health Symptoms Screen Negative	
	N	%	N	%
Yes	37	(88.1%)	5	(11.9%)
No	41	(34.5%)	78	(65.5%)

p-value < 0.001; OR(Yes/Positive:No/Negative) = 14.1 (5.1 – 38.6)

(10) Conclusions:

(a) Mental health complaints affected a considerable portion of the survey participants (23.5%). Approximately 11% of survey participants met the screening criteria for being at high risk for PTSD; 17% for depression; 3% for alcohol problems; 15% for generalized anxiety; and 15% for panic attacks. **Table 47** presents the percentage comparisons of those at high risk for mental health complications with those of the Pentagon Post-Disaster Health Assessment respondents who were at the Pentagon during the terrorist attack on 11 September 2001.

Table 47
WTCSHA vs. PPDHA High-Risk Rates

Percent at High Risk For	World Trade Center Support Health Assessment (N=162)		Pentagon Post-Disaster Health Assessment (N=4588 to 4665)	
	N	%	N	%
PTSD	17	(10.5%)	370	(7.9%)
Depression	27	(16.7%)	811	(17.7%)
Alcohol Problems	4	(2.5%)	116	(2.5%)
Generalized Anxiety*	25	(15.4%)	1239	(26.9%)
Panic Attacks*	24	(14.8%)	1071	(23.1%)
Any Mental Health Outcome*	38	(23.5%)	1837	(40.0%)

Missing values omitted from calculations

*items (asterisked/in red) indicate a significant difference (p-value < 0.05)

(b) Although these rates were based on screening questions and not full diagnostic scales, the rates are comparable to those observed in more systematic studies of other populations following terrorist events. Galea, et al. reported 8% of their random Manhattan telephone respondents had symptoms consistent with PTSD and 10% had symptoms consistent with depression one to two months post-September 11, 2001 (11). Also, in a study of 182 adults who were in the immediate area of the Oklahoma City bombing assessed six months after the event, 45% had a diagnosed psychiatric disorder, most commonly PTSD and depression (12).

(c) Mental health symptom categories identified on this survey were found to strongly correlate with reduced daily functioning and use of counseling services. Those in one or more high risk groups were 36 times more likely than those not in any mental health risk group to experience significant impairment in daily functioning.

(d) The importance of having multiple confidants was borne out in this study. Those with more than two confidants were six times less likely to report suffering negative mental health outcomes. Further, this factor was found to be independently significant for every mental health domain. Nevertheless, due to the nature of the study, it is impossible to tell if having more confidants contributes to mental health functioning, if having one or more negative mental health outcomes contribute to greater social isolation, or if the two aspects are correlated through a third, but unidentified variable.

(11) Recommendations:

(a) The short mental health questionnaire used in this survey is a prototype that can be used for rapid public health assessment of the mental health impact of future terrorist events. It may also be useful as a rapid screening tool for military members redeploying from combat areas.

(b) Follow-up surveys of the population would help measure the full impact of occupational exposure on those participating in the WTC clean up. However, since this exposure, a number of these soldiers have been called up for extended tours of duty in support of the war on terrorism. These factors will have to be taken into consideration should the population be subsequently surveyed again. If they are re-surveyed, full scale measures of the key mental disorder categories should be utilized so that the sensitivity, specificity, and predictive value of individual items included on this initial survey can be better delineated.

(c) Given the continuing OPTEMPO and PERSTEMPO of the military, it is likely that many more service members will be exposed to trauma (directly or indirectly) and that many more will be exposed to multiple traumas than has been the case since the Vietnam War. Good baseline measures of functioning and comprehensive data on past trauma for all service members would be very beneficial in better understanding later exposures in context.

Discussion and Lessons Learned

The World Trade Center Support Health Assessment was a concerted effort to reach out to the WTC rescue and recovery workers that were a part of the Army Family following the worst terrorist attack in American history. The WTCSHA was a success in that context. It provided a venue where personnel could have their concerns addressed on an individual basis and could be directed to sources of additional information and assistance as required.

The inclusion of New Jersey Army National Guard soldiers who were not federalized highlighted the difficulties with the National Guard working exclusively in their state capacity. They were not authorized care in the Federal Health care system. Any referrals had to be authorized by their respective companies. New York did offer to include them in their comprehensive evaluation program, but in many occasions, the soldier's location made this a difficult choice.

Lessons learned includes:

Start writing the report immediately. Remembering Points Of Contact (POCs), contributors, those who provided assistance, and sources of information becomes more difficult to impossible months later.

The demographic section of the questionnaire did not include rank. When responding to requests for more information, the personnel could not address by rank/title. Many senior personnel (enlisted and officer) prefer to be addressed by rank.

The questionnaire did not request the actual dates at the locations. This makes it harder to make inferences from the date of onset of symptoms.

Modifying pre-existing questionnaires saves time while assuring a quality product. Many questions were already peer reviewed.

Get help from personnel with 'boots on the ground'. The U. S. Army Corps of Engineers provided the appropriate descriptions of the NY locations where support activities were located. They assisted in setting up these locations and knew where their people had been on the ground, something the personnel responsible for writing the questions did not know.

The questionnaire included a coversheet stating we would not contact the responder unless they requested it. This limited us in our ability to contact them if a question arose concerning a response. While this was done to improve the response rate, it did limit our ability to follow up with respondents.

Questionnaire asked for method to be contacted and provided two choices, e-mail or phone. Most listed both phone numbers and e-mail accounts, but did not offer a

preference. Recommend adding a block to indicate a preference. Additionally, the questionnaire did not ask the best time to call; so most calls were not successful on initial efforts. This wastes a number of man-hours.

The WTCSHA provides a wealth of information for this unique support effort. This provides a baseline for investigations into possible long-term effects from a short-term exposure.

APPENDIX A
USACHPPM WTCSHA Team

Appendix A

Team Leader

Colonel Richard Kramp
Occupational Medicine Consultant
Directorate of Occupational and Environmental Medicine

Members

Major Anthony Cox
Medical Consultant
Population Resource Program
Directorate of Health Promotion and Wellness

Ms. Nikki Jordan
Epidemiologist
Population Health Outcomes Program
Directorate of Epidemiology and Disease Surveillance

Mr. Amish Shah
Epidemiologist Intern
Population Health Outcomes Program
Directorate of Epidemiology and Disease Surveillance

APPENDIX B

World Trade Center Support Health Assessment Survey

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World Trade Center Support Health Assessment

Please complete the questionnaire as accurately as possible.
DO NOT LEAVE ANY QUESTIONS BLANK. Thank you for your assistance.

For optimum accuracy, please print in capital letters and avoid contact with the edge of the box.

The following will serve as an example:

A	B	C	D	E	F	G	H	I	J	K	L	M
N	O	P	Q	R	S	T	U	V	W	X	Y	Z

Example of numbers

1	2	3	4	5	6	7	8	9	0
---	---	---	---	---	---	---	---	---	---

Shade Circles Like This--> ●

Not Like This--> ~~⊗~~ ⊙

PRIVACY ACT STATEMENT – World Trade Center Support Health Assessment

AUTHORITY: 5 U.S.C. 301; and Executive Order 9397

PRINCIPAL PURPOSE: The World Trade Center Support Health Assessment is being conducted to determine the nature and extent of illnesses and injuries sustained by Army personnel, active duty, active reserve, National Guard and civilian, supporting the rescue and recovery efforts at the World Trade Center on or after September 11th.

ROUTINE USES: None

DISCLOSURE: Voluntary. Failure to respond will not result in any penalty. However, maximum participation is encouraged so that data will be complete and representative. Your survey questionnaire will be treated as confidential. Identifiable information will be used only by persons engaged in the survey.

All survey information will be retained by United States Army Center for Health Promotion and Preventive Medicine.

I HAVE READ THE ABOVE AND UNDERSTAND THE INFORMATION.

Signature

		/			/		
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Today's date (MM/DD/YY)

World Trade Center Support Health Assessment

QUESTIONS 1-11

MM/DD/YYYY

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 -

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 -

2	0	0	2
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Examples: 9/18/2001 or 01/25/2002

2. How old are you?	
---------------------	--

☐ Male

☐ Female

☐ Active Duty
☐ Active Reserve or National Guard Duty
☐ Civilian GS employee
☐ Civilian WG employee
☐ Civilian SES employee
☐ Civilian contract employee
☐ Other

[illegible]

6. What is your SSN?				-			-			
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House # and Street OR PO Box #

[illegible][illegible]

Zip Code

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[illegible][illegible][illegible]

SECTION B *This section helps us to briefly understand your overall health before the attack, what you might have noticed in the air after the attack, and where you normally receive your health care.*

A. Participate in the rescue/recovery effort?

B. Help at ground zero

☐ Yes ☐ No

☐ None
 ☐ Supervisory
☐ Hand digging
 ☐ Food Service
☐ Firefighting
 ☐ Sanitation
☐ Bucket Brigade
 ☐ Utilities Worker
☐ Search and Rescue
 ☐ Steel cutting/torch
☐ Traffic Control
 ☐ Gas powered tool operations
☐ Survey/Engineering
 ☐ Other
☐ Security

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13. During your World Trade Center Support Operations, which locations did you work in?
(Select all that apply)

- ☐ Within Exclusion Zone (collapsed remains/debris of WTC complex - within Ground Zero)
- ☐ Outside Exclusion Zone (edge of collapsed remains/outside exclusion area but in 5 blocks of Ground Zero)
- ☐ DTOS (Deployable Tactical Operations System)
- ☐ Fresh Kills Landfill
- ☐ Other (Please specify)

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13.1 Please indicate how much time you spent in each location, your exposures while there, and the amount of time you spent wearing a respirator at each location. (Select all that apply)

Location	Total No. of Hours at Location	Exposure to smoke, dust, chemicals/fumes		Percent of time wearing a respirator						
Within Exclusion Zone	<table><tr><td></td><td></td><td></td></tr></table>				<input type="radio"/> Yes	<input type="radio"/> No	<table><tr><td></td><td></td><td></td></tr></table>			
Outside Exclusion Zone	<table><tr><td></td><td></td><td></td></tr></table>				<input type="radio"/> Yes	<input type="radio"/> No	<table><tr><td></td><td></td><td></td></tr></table>			
DTOS	<table><tr><td></td><td></td><td></td></tr></table>				<input type="radio"/> Yes	<input type="radio"/> No	<table><tr><td></td><td></td><td></td></tr></table>			
Fresh Kills Landfill	<table><tr><td></td><td></td><td></td></tr></table>				<input type="radio"/> Yes	<input type="radio"/> No	<table><tr><td></td><td></td><td></td></tr></table>			
Other	<table><tr><td></td><td></td><td></td></tr></table>				<input type="radio"/> Yes	<input type="radio"/> No	<table><tr><td></td><td></td><td></td></tr></table>			

14 Do you participate in any of the following activities or hobbies? (Select all that apply)

Before 9/11

- ☐ Auto mechanic/body work
- ☐ Bird raising/animal rearing
- ☐ Hobby farming/gardening
- ☐ Home renovation
- ☐ Painting (home/apartment/commercial)
- ☐ Soldering
- ☐ Stain glass production
- ☐ Target shooting
- ☐ Welding
- ☐ Woodworking
- ☐ Other

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After 9/11

- ☐ Auto mechanic/body work
- ☐ Bird raising/animal rearing
- ☐ Hobby farming/gardening
- ☐ Home renovation
- ☐ Painting (home/apartment/commercial)
- ☐ Soldering
- ☐ Stain glass production
- ☐ Target shooting
- ☐ Welding
- ☐ Woodworking
- ☐ Other

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<input type="radio"/> Allergies/Hay fever that affect breathing?	<input type="radio"/> Stroke
<input type="radio"/> Asbestosis	<input type="radio"/> Angina
<input type="radio"/> Asthma	<input type="radio"/> Heart failure
<input type="radio"/> Chronic bronchitis	<input type="radio"/> Swelling in legs or feet not caused by walking
<input type="radio"/> Emphysema	<input type="radio"/> Heart arrhythmia (heart beating irregularly)
<input type="radio"/> Pneumonia	<input type="radio"/> Anxiety
<input type="radio"/> Tuberculosis	<input type="radio"/> Multiple Chemical Sensitivity
<input type="radio"/> Silicosis	<input type="radio"/> Depression
<input type="radio"/> Pneumothorax (collapsed lung)	<input type="radio"/> Post Traumatic Stress Disorder
<input type="radio"/> Liver Disease	<input type="radio"/> High blood pressure
<input type="radio"/> Kidney Disease	<input type="radio"/> None
<input type="radio"/> Heart attack	<input type="radio"/> Other Illnesses (Please specify)

[illegible]

- ☐ Never
- ☐ Yes, I have smoked for
 - ☐ the past 6 months only
 - ☐ the past 12 months
 - ☐ the past 1-5 years
 - ☐ over 5 years

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17. Did you breathe any of the following during the World Trade Center support? (Select all that apply)

- ☐ Smoke from fires
☐ Dust
☐ Chemicals/fumes
☐ None of the above (Skip to question 18)

17.1 Please estimate the amount of time you were exposed to any of the above.

- Smoke from fires

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☐ Minutes ☐ Hours ☐ Days
 Dust

--	--	--

☐ Minutes ☐ Hours ☐ Days
 Chemicals/fumes

--	--	--

☐ Minutes ☐ Hours ☐ Days

17.2 Please estimate the intensity of your exposure.

***SMOKE/DUST Intensity:** light (can see, but doesn't impact vision), medium (moderate, but can see images), or heavy (can't see or identify any objects)*

***Chemicals/fumes Intensity:** light (can smell, but doesn't irritate), medium (can smell, mildly irritating), or heavy (can smell, very irritating)*

- Smoke from fires ☐ Light ☐ Medium ☐ Heavy
 Dust ☐ Light ☐ Medium ☐ Heavy
 Chemicals/fumes ☐ Light ☐ Medium ☐ Heavy

18. Where do you usually get your health care? (Select all that apply)

- ☐ Military Treatment Facility
☐ Civilian Treatment Facility
☐ Personal (civilian) Medical Provider
☐ Other

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SECTION C

EVERYONE, PLEASE ANSWER QUESTIONS 19 & 20, AND PROCEED FROM THERE.

19. Do you HAVE any OLD health problems or health concerns that have gotten worse since the World Trade Center support operations? (Select only one - Yes or No)

- ☐ Yes
☐ No

20. Do you NOW HAVE, or at any time since the World Trade Center support operations HAVE YOU HAD, a NEW health problem(s) or health concern(s)? (Select only one - Yes or No)

- ☐ Yes
☐ No

**If you answered YES to EITHER Question 19 OR 20, please answer ALL remaining questions.
If you answered NO to BOTH Questions 19 AND 20, please GO TO QUESTION 27.**

Q No

☐ Military Treatment Facility

○ Self-care

[illegible]

☐ None

○ Burns

○ Irritated eyes, nose, or throat

○ Hearing problems

☐ Other

[illegible]

☐ Not at all ☐ A Little Bit ☐ Moderately ☐ Quite a Bit ☐ Extremely

☐ Not at all ☐ Several Days ☐ More than half the days ☐ Nearly every day

☐ Not at all ☐ Several Days ☐ More than half the days ☐ Nearly every day

☐ Not at all ☐ Several Days ☐ More than half the days ☐ Nearly every day

☐ Yes ☐ No

☐ Not at all ☐ A Little Bit ☐ Moderately ☐ Quite a Bit ☐ Extremely

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31. Since the World Trade Center support operations began, have you had repeated, disturbing memories or dreams?

☐ Not at all ☐ A Little Bit ☐ Moderately ☐ Quite a Bit ☐ Extremely

32. Since the World Trade Center support operations began, have you avoided thinking about it or having feelings about the disaster?

☐ Not at all ☐ A Little Bit ☐ Moderately ☐ Quite a Bit ☐ Extremely

33. Since the World Trade Center support operations began, have you been feeling jumpy or easily startled?

☐ Not at all ☐ A Little Bit ☐ Moderately ☐ Quite a Bit ☐ Extremely

34. Since the World Trade Center support operations began, how much did personal or emotional problems keep you from doing your usual work, studies, or other daily activities?

☐ Not at all ☐ Very little ☐ Somewhat ☐ Quite a lot ☐ Could not do daily activities

35. How many close friends or relatives do you have (people you feel at ease with and can talk to about what is on your mind)?

☐ None ☐ One or Two ☐ Several ☐ Many

36. How many times since the World Trade Center support operations began have you visited a psychiatrist, psychologist, social worker, chaplain, or other mental health care provider?

☐ Not at all ☐ Once ☐ Two or Three ☐ More Than Three

37. Since the World Trade Center support operations began, have you used alcohol more than you meant to?

☐ Yes ☐ No ☐ Don't drink

38. Since the World Trade Center support operations began, have you felt the need to cut down on your drinking?

☐ Yes ☐ No ☐ Don't Drink

39. Did you ever have mental health treatment BEFORE the World Trade Center support operations began (treatment by a psychiatrist, psychologist, social worker, or other mental health

operations began) ☐ Never ☐ Yes, Within Past Year ☐ Yes, 1-5 Years ago ☐ Yes, Over 5 Years Ago

40. BEFORE the World Trade Center support operations began, did you EVER have a terrible experience that caused you to fear you would be injured or killed?

☐ No ☐ Yes, only as a child ☐ Yes, only as adult ☐ Yes, BOTH as a child & adult

40.1 If you answered YES to any part of question 40 above, how many times?

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☐ Yes ☐ No

☐ Family member ☐ Close friend ☐ Coworker ☐ Other acquaintance

☐ Yes ☐ No

☐ Not at all ☐ A Little Bit ☐ Moderately ☐ Quite a Bit ☐ Extremely

☐ Not at all ☐ A Little Bit ☐ Moderately ☐ Quite a Bit ☐ Extremely

☐ Yes ☐ No

PHONE:

 -

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[illegible]

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IF YOU FEEL YOU NEED ANY MEDICAL CARE OR HAVE ANY HEALTH CONCERNS, PLEASE CALL EITHER:

- D-1

APPENDIX C
REFERENCES

Appendix C

References

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APPENDIX D

Army Corps Of Engineers Survey

FOLLOW-UP WORLD TRADE CENTER ON-SITE DEPLOYMENT MEDICAL SCREENING PACKET

CONTENTS

Completion Instructions

(Pages B-1 and 2)

World Trade Center Medical Information Sheet

(Employee Completes, Page C)

Follow-Up Medical Screening Questionnaire for World Trade Center On-Site Deployment

(Employee Completes, Pages D-1, 2, and 3)

USACE Medical Provider Recommendations Based on Assessment of Screening Questionnaire

(Employee Completes Top Half and Physician Completes Bottom Half, Page E)

Medical Screening Declination

(Employee Completes, Page F)

Background: Numerous New York City firefighters who deployed to the World Trade Center (WTC) on or a week after 11 Sep 01 have complained of respiratory problems due to potential exposures to airborne contaminants. The enclosed Follow-Up WTC Medical Screening Questionnaire and other documents have been developed to identify USACE employees who may have similar health concerns due to potential exposures to respiratory hazards at or near the WTC. Although completion of the enclosed documents is voluntary, it is highly recommended that USACE personnel who worked at or near “Ground Zero” of the WTC before 25 Sep 01 complete the attached Medical Information Sheet, Medical Screening Questionnaire, and USACE Medical Provider Recommendations Memorandum and fax them to the USACE Medical Provider. If you decide to decline this medical screening, complete the declination at Page F and fax it to the USACE Medical Provider. **Purpose:** Completed medical screening questionnaire will be used by the Medical Provider to determine whether you should be provided a hands-on medical examination related to your potential exposures to respiratory hazards at or near the WTC.

A

Completion Instructions

- 1. World Trade Center Medical Information Sheet.**
 - a. Paragraph 1. Print last name, first name and middle initial.**
 - b. Paragraph 2. Print the name of the USACE command you work for (e.g. Jacksonville District (CESAJ)).**
 - c. Paragraph 3. Print the User Name that you use to log into ENGLink.**
 - d. Paragraph 5. Provide fax number for your Emergency Operations Center.**
 - e. Paragraph 7. Sign and date.**

- 2. Follow-Up Medical Screening Questionnaire for World Trade Center On-Site Deployment.**
 - a. Part A.**
 - 1. Legibly print all of the information requested for lines 1, 2, 4, 6, 7 and 8.**
 - 2. Circle whether you are a Male or Female on Line 3.**
 - 3. Be sure that you sign and date the questionnaire on line 5, certifying that the information you provide is correct to the best of your knowledge and belief.**
 - b. Part B.**
 - 1. Print your Emergency Duty Description Job Title.**
 - 2. Note the location(s) where you worked at or near the World Trade Center, your dates of arrival and departure, and the total number of hours you were at each location.**
 - 3. Note whether you wore a respirator and, if applicable, the type of respirator you used at each location.**
 - c. Part C.**
 - 1. Circle either a “yes” or “no” response to each question.**
 - 2. Use the space at the end of the questionnaire to provide any additional medical information you feel will be helpful to the Medical Provider in conducting the assessment.**
 - 3. Read the Privacy Act Notice.**
 - d. The Medical Provider will review your responses. Upon review of the information you provided, the Medical Provider may need to contact you for additional medical information. If the Medical Provider contacts you for additional information, please make yourself available in a timely manner and ensure coordination with your private physician if requested.**

- 3. USACE Medical Provider Recommendations Based on Assessment of Screening Questionnaire.**
 - a. Complete address and fax number of your Emergency Operations Center**
 - b. Print the office symbol of your Safety and Occupational Health Office**
 - c. Print the name and office symbol of your supervisor**
 - d. Print your name and office symbol**

4. Upon completion of (1) World Trade Center Medical Information Sheet, (2) Follow-Up Medical Screening Questionnaire for World Trade Center On-Site Deployment, and (3) USACE Medical Provider Recommendations Memorandum, immediately perform the following actions.

- a. Fax all three to the below Medical Provider.**

Medical Provider: Kenneth Chase, MD. and Samuel Scott, MD.

Telephone No. (202) 463-6698

Fax No. (202) 223-6525

- b. Keep originals for your personal file.**

5. Medical Screening Declination. If you decide to decline this medical screening, complete the declination at Page F.

- a. Legibly print all of the information requested for Lines 1, 2, 4, and 5.**
- b. Sign your name on Line 3.**
- c. Fax the completed declination to Kenneth Chase, M.D. at Fax No. (202) 223-6525. Dr. Chase's office phone number for the facsimile transmittal sheet is (202) 463-6698.**

NOTE: The USACE Medical Provider Recommendations Memorandum is the only information sent back from the medical provider to your Emergency Operations Center. Your completed faxed Packet is maintained at the medical provider's office.

B-2

WORLD TRADE CENTER MEDICAL INFORMATION SHEET

**To Dr. Kenneth H. Chase
Dr. Samuel Scott**

- 1. I, Mr./Ms. _____, was assigned/volunteered for
(Last Name, First Name, Middle Initial)
deployment to New York to participate in the emergency response operation for the World Trade Center disaster of 11 Sep 01.**
- 2. My Division/District/FOA is _____
(Example – CESAJ, Jacksonville District)**
- 3. The “User Name” that I use to log into ENGLink is _____
(Example – k3so9psw)**
- 4. The attached Medical Screening Questionnaire and USACE Medical Provider Recommend-ations Memorandum are provided to assist you in making a medical decision of whether I should be given a medical examination related to my exposures at or near the World Trade Center.**
- 5. After you have completed your medical review, please fax the USACE Medical Provider Recommendations Memorandum to my Emergency Operations Center at _____**
- 6. Any questions you may have regarding the information I have provided should be directed to me by telephone at the number provided in the attached questionnaire.**
- 7. I certify that I have reviewed the information supplied by me and that it is true and complete to the best of my knowledge, and that I have read the Privacy Act Notice assigned to the use of this information.**

**Signature of _____ Date _____
Employee**

C

**FOLLOW-UP MEDICAL SCREENING QUESTIONNAIRE FOR WORLD TRADE
CENTER ON-SITE DEPLOYMENT**

Instructions: Complete this questionnaire according to the attached packet instructions.

Part A. Personal Identification:

1. Name: _____ **2. SSN:** _____

3. Sex (circle one): Male/Female **4. Date of Birth:** _____

I certify that information given by me in connection with this questionnaire is correct to the best of my knowledge and belief.

5. _____

(Signature)

(Date)

6. Your Normal Duty Station Job Title: _____

7. Office Mailing Address

Office	Office Symbol	District
City	State	Zip Code

8. Commercial Telephone Numbers/E-mail Address:

Work: _____ **Home:** _____

Work FAX: _____ E-mail address: _____

Part B. Work History at World Trade Center (WTC):

1. Emergency Duty Description Job Title: _____

2. Where did you work at or near the WTC? – Rubble Pile Perimeter of Rubble Pile DTOS

Rubble Pile – the collapsed remains and other debris within the WTC Complex
(Ground Zero)

Perimeter of Rubble Pile – the edge of the collapsed remains and other debris within
the WTC Complex

DTOS – Deployable Tactical Operations System

Total No. of	Date of	Date of
<u>Location</u>	<u>Arrival</u>	<u>Departure</u>
<u>Hours at Location</u>		

(a)

(b)

(c)

3. Did you wear a respirator at any of the above locations (circle one): Yes/No

If "yes," what type and at which location: _____

Part C. Medical Questions. (Circle "yes" or "no").

1. Do you currently smoke tobacco, or have you smoked tobacco in the past? Yes/No
2. Have you ever had Diabetes (sugar disease)? Yes/No
3. Have you ever had Allergic reactions that interfere with your breathing? Yes/No
4. Have you ever had any of the following pulmonary or lung problems?
 - a. Asbestosis: Yes/No
 - b. Asthma: Yes/No
 - c. Chronic bronchitis: Yes/No
 - d. Emphysema: Yes/No
 - e. Pneumonia: Yes/No
 - f. Tuberculosis: Yes/No
 - g. Silicosis: Yes/No
 - h. Pneumothorax (collapsed lung): Yes/No
 - i. Lung cancer: Yes/No
 - j. Any chest injuries or surgeries: Yes/No
5. Do you currently have any of the following symptoms of pulmonary or lung illness?
 - a. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No
 - b. Have to stop for breath when walking at your own pace on level ground: Yes/No
 - c. Shortness of breath when washing or dressing yourself: Yes/No
 - d. Shortness of breath that interferes with your job: Yes/No
 - e. Coughing that produces phlegm (thick sputum): Yes/No
 - f. Coughing that wakes you early in the morning: Yes/No
 - g. Coughing that occurs mostly when you are lying down: Yes/No
 - h. Coughing up blood in the last month: Yes/No
 - i. Wheezing that interferes with your job: Yes/No
 - j. Chest pain when you breathe deeply: Yes/No
6. Have you ever had any of the following cardiovascular or heart problems?
 - a. Heart attack: Yes/No
 - b. Stroke: Yes/No
 - c. Angina: Yes/No
 - d. Heart failure: Yes/No

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- e. Swelling in your legs or feet (not caused by walking): Yes/No
- f. Heart arrhythmia (heart beating irregularly): Yes/No
- g. High blood pressure: Yes/No

7. Do you currently take medication for any of the following problems?

- a. Breathing or lung problems: Yes/No
- b. Heart trouble: Yes/No
- c. Blood pressure: Yes/No
- d. Sinus Problems: Yes/No
- e. Please list any other medications, including over-the-counter medications, vitamins, and vitamin supplements, that you use on a routine basis:

8. Have you ever had any of the following conditions?

- a. Eye irritation treated by a medical professional, which you never experienced before Sep 01: Yes/No
- b. Skin allergies or rashes: Yes/No
- c. Ear, nose, or throat problems that you never experienced before Sep 01: Yes/No

9. Have you ever worked on a HAZMAT team? Yes/No

This space is provided for any additional medical information you may wish to provide:

PRIVACY ACT NOTICE: This information is provided in accordance with the requirements of the Privacy Act of 1974. (See AR 340-21.)

AUTHORITY: 5 U.S.C. 3301; E.O. 9630; 5 CFR Part 293, "Personnel Records" and Part 339, "Medical Qualification Determinations"; OPM/GOVT-10, "Employee Medical File System Record".

PURPOSE: The medical screening questionnaire, interviews, data obtained from tests, review of existing records and review by a medical professional is utilized to determine whether assigned or volunteer employees have any health problems that would prevent them from deployment to, or adversely impact their assigned duties at, emergency response sites. The medical information collected will be filed with other medical record information in the employee's medical file (EMF).

ROUTINE USE: Information may be shared with other Federal agencies such as OSHA and FEMA and state and local agencies for law enforcement, and occupational and/or public health purposes.

DISCLOSURE: Providing this information is voluntary. However, refusal to provide the information requested, including medical information and social security number, may result in the employee not being deployed to perform emergency response assignments at emergency response sites.

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THRU: US Army Corps of Engineers, _____
District/Division/FOA
ATTN: Emergency Operations Center
Fax _____

THRU: Chief, Safety and Occupational Health Office _____
(Office Symbol)

THRU: Employee's Supervisor _____
(Name and Office Symbol of Your Supervisor)

TO: Employee _____
(Your Name and Office Symbol)

SUBJECT: USACE Medical Provider Recommendations Based on Assessment of
Screening Questionnaire

1. Mr./Ms. _____ has been medically evaluated and:
Print Last Name, First Name, Middle Initial

Check the applicable block

a. ☐ is recommended for a medical examination based upon a review of the completed medical screening questionnaire.

b. ☐ is not recommended for a medical examination based upon a review of the completed medical screening questionnaire.

2. Physician's notes or comments: _____

Signature of Physician

Date

Print Name

Phone Number

E

**DECLINATION FOR FOLLOW-UP
MEDICAL SCREENING FOR WORLD TRADE
CENTER ON-SITE DEPLOYMENT**

I have been given the opportunity to participate, at no charge to myself, in medical screening related to my work activities in September 2001 at or near the World Trade Center in New York City. I was provided a Follow-Up World Trade Center On-Site Deployment Medical Screening Packet, including Completion Instructions, a World Trade Center Medical Information Sheet, a Follow-Up Medical Screening Questionnaire for World Trade Center On-Site Deployment, USACE Medical Provider Recommendations Based on Assessment of Screening Questionnaire, and this declination form. However, I decline to complete the above forms because I do not wish to participate in the medical screening.

1. Employee's Name (Print): _____

2. Social Security Number: _____

3. Employee's Signature: _____ **4. Date:** _____

5. My Complete Office Address:

(Office)

(Office Symbol)

(Division/District/FOA) (City) (State) (Zip Code)

F

APPENDIX E

ACKNOWLEDGMENTS

Appendix E Acknowledgments

The WTCSHA Team would like to thank the following organizations and individuals who were instrumental in ensuring the successful development and deployment of the survey.

Office of the Surgeon General

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Walter Reed Army Institute of Research

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Directorate of Epidemiology of Disease Surveillance
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APPENDIX F

**DEVELOPMENT OF MENTAL HEALTH QUESTIONS
ON THE WTCSHA**

Appendix F

Development of Mental Health Questions on the WTCSHA

1. Most of the questions used in the mental health portion of the WTCSHA questionnaire were taken from the PPDHA survey.
2. The PPDHA mental health questions were developed through consultation between WRAIR (LTC Hoge), Deployment Health Clinical Center (LTC Engel), USUHS (Dr. Ursano), and the specialty consultants to the Army Surgeon General from psychiatry (COL Orman), clinical psychology (COL Crandell), and social work (COL Patterson). The questions about mental health focused on four main symptom domains, as well as key risk/ protective factors considered to be most important following a terrorist attack (e.g., loss of friend or co-worker, prior mental health care use, prior trauma, and social support). The symptom domains were: acute and posttraumatic stress symptoms, depression, anxiety/panic attacks, and alcohol abuse, as well as an overall measure of mental health functioning (1).
3. Although a number of standardized assessment instruments existed for the mental health domains of interest, a short, standardized mental health instrument that assessed all the domains of interest did not exist. The PPDHA authors decided to choose single questions and subsets of questions from existing surveys and/or stem questions from the Diagnostic and Statistical Manual of Mental Disorders (2) for each of the mental health outcomes of interest. The items were drawn mostly from standardized instruments widely used in primary care settings, modified to fit the current situation (primarily changing the time frame of reference to post-September 11, 2001). In sum, the PPDHA utilized 17 selected questions in an attempt to cover elements from all of the important mental health domains for this rapid public health assessment.
4. In order to be compatible with the PPDHA, the WTCSHA utilized the same questions with only the following modifications:
 - a. The wording of some questions taken from the PPDHA had to be altered for use with the WTCSHA. For example, "Since the attack,..." (PPDHA) was modified to read, "Since the World Trade Center support operations began,...."
 - b. Question 40.1 – asking how many traumatic events the individual suffered prior to participating in the WTC support operations – was added as a rough measure of the amount of prior trauma, in addition to simply the presence or absence of prior trauma.
 - c. Question 42 – asking whether, during support operations, the individual saw or handled the remains of anyone – was modified to include the handling of the remains in addition to visual observation of remains or injured personnel.

d. Question 43 – asking whether the individual feels safe at home – was added in addition to the PPHDA question asking if they felt safe at work (#58; WTCSHA #44).

5. Specifics About Each Question. The following briefly describes the rationale supporting the use of each of the mental health questions on the WTCSHA (**Appendix B, Section E, Questions 27-45**):

a. Question 27 has to do with a common dissociative experience that many people describe at the time of traumatic events that has been shown to be predictive of PTSD. The question was drawn from the Peritraumatic Dissociative Experiences Questionnaire (3).

b. Question 28 includes stem items for the DSM-IV diagnoses of generalized anxiety (question 28a) and major depression (questions 28b and 28c) derived from the Patient Health Questionnaire (PHQ), which is a self-administered version of the Primary Care Evaluation for Mental Disorders scale (PRIME-MD) (4). The two stem questions for depression have been shown to have high sensitivity and specificity for screening for major depression when compared with subsequent structured interview or clinician evaluation (5, 6).

c. Question 29 is the stem item for the DSM-IV panic disorder diagnosis derived from the PHQ (4).

d. Questions 30-33 cover the three key domains from DSM-IV of acute stress reaction and PTSD, including re-experiencing the trauma (question 31), emotional numbing and avoidance (questions 30 and 32), and physiological hyperarousal (question 33). These are derived from the PTSD checklist from the National Center for PTSD (7). Out of these three domains, questions about emotional numbing and avoidance in particular have been shown to be strongly predictive of PTSD among survivors of the Oklahoma City bombing (8).

e. Question 34 is a general measure of mental health functioning, which is a standard component of the Short Form health questionnaires (SF8, SF12, and SF36), widely used in primary care and general population assessments (9).

f. Question 35 is a question about social support, an important buffer to the impact of traumatic events (10).

g. Question 36 pertains to mental health service utilization since the operational exposure. This was deemed important for planning the health care response.

h. Questions 37 and 38 pertain to the use of alcohol since the attack, from the Two-Item Conjoint Screening test developed for screening in primary care

settings (11). These two questions have been shown to have approximately an 80% sensitivity and specificity when compared with structured diagnostic instruments for alcohol abuse or dependence (12).

i. Question 39 pertains to prior mental health service utilization, an important risk factor for mental health problems following trauma.

j. Questions 40 and 40.1 pertain to prior trauma, and are used in place of a trauma checklist (7,11). Prior trauma is a significant risk factor for PTSD following subsequent trauma.

k. Questions 41 and 42 are key trauma exposure questions in the areas of traumatic loss and exposure to death through the handling of remains.

l. Questions 43 and 44 pertain to one's current feelings of safety at home and in the workplace. They were included due to recognition that safety was a major concern for many personnel as a result of terrorist attacks.

6. In addition to the individual questions, some questions were taken together in order to form more accurate measures of risk within domains of interest:

a. PTSD High-Risk Group:

(1) For the diagnosis of PTSD, the DSM-IV requires that the following criteria be met: 1) a traumatic event must occur that threatens death or serious injury and causes a response involving horror, fear, or helplessness; 2) the traumatic event must be re-experienced; 3) avoidance of stimuli associated with the trauma or general emotional numbing occur; and 4) hyperarousal must be present.

(2) The first requirement was considered met for all respondents, so no questions were asked about this on the survey. Persons who had a positive response (moderate to extreme levels on a 5-point scale, ranging from "not at all" to "extremely") in all 3 of the remaining areas at any time since their operational exposure were considered to meet the screening criteria for the PTSD high-risk group.

(3) Re-experience of the traumatic event was classified on the survey as repeated disturbing memories or dreams; avoidance was classified as avoiding thinking about or having feelings about the disaster; general numbing was defined as inability to have loving feelings towards close contacts; and hyperarousal was defined as feeling jumpy or easily startled.

b. Depression High-Risk Group:

(1) For depression, the DSM IV recognizes anhedonia (absence of pleasure) and depressed mood as the two most important stem questions necessary to make the diagnosis of major depression (13). Studies have shown that if either of these is positive, there is a reasonably high sensitivity and specificity compared with the full diagnostic criteria (14,15).

(2) Respondents experiencing either of these symptoms (anhedonia OR depressed mood) at the threshold level ("more than half the days" to "nearly every day") were considered to be in the high-risk group for depression. Respondents who reported "not at all" or "several days" to both questions were ruled out as candidates at higher risk for depression.

c. Generalized Anxiety/Panic Attacks High-Risk Groups:

(1) High-risk groups for generalized anxiety and panic attacks were based on positive responses to single survey questions (13).

(2) Respondents were considered to be at high risk for generalized anxiety if they reported being "bothered by feeling nervous anxious, on edge or worrying a lot about different things" for "more than half the days" to "nearly every day" since operational exposure. Respondents who reported "not at all" or "several days" were ruled out as candidates at higher risk for generalized anxiety.

(3) Respondents were considered at high risk for panic attacks based on a simple self-report of panic attacks defined as sudden onset of panic since the 9/11 attack, but not including the attack itself.

d. Alcohol Abuse High-Risk Group:

(1) The survey asked two commonly used questions about alcohol use: (a) "Since the attack have you used alcohol more than you meant to?" and (b) "Since the attack have you felt the need to cut down on your drinking?". Respondents who answered yes to both questions were placed in this high-risk group.

(2) These two questions have also been shown to be highly reliable when compared with much longer structured alcohol screening questionnaires, demonstrating approximately an 80% sensitivity and specificity by comparison (16).

Annex A to Appendix F

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